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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/980,606	11/15/2001	Manabu Yamada	45923/DBP	8168

7590 12/15/2005

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EXAMINER
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CHIAM, DINH D

ART UNIT	PAPER NUMBER
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2883

DATE MAILED: 12/15/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/980,606

Applicant(s)

YAMADA ET AL.

Examiner

Erin D. Chiem

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 26 September 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1,5,8-11 and 44 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,5,8-11 and 44 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 9/26/05.

- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_.

### **DETAILED ACTION**

This office action is in response to the amendment filed on September 26, 2005. Claims 1, 5, 8-11, and 44 are amended; claims 2-4 and 6-7 are canceled; claims 12-43 are withdrawn. The IDS filed with the amendment are acknowledged.

#### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 5, 8-11, and 44 are rejected under 35 U.S.C. 103(a) as being unpatentable over Isono et al. (US 5,259,044 Isono herein forth) in view of Mekata et al. (JP 3-145623 Mekata herein forth) and Parriaux et al. (US 5,280,550 Parriaux herein forth).

Isono teaches an optical waveguide modulator equipped with an output light monitor comprising: a dielectric substrate made of lithium niobate (10) and an optical waveguide formed on the substrate wherein the optical waveguide comprising a plurality of surface optical waveguide portions (i.e., the separate arms of the Mach-Zehnder modulator), an optical waveguide connecting portion A on which the waveguide converged and connected to each other and an output light-outputting optical waveguide portion (52) connected to the optical waveguide-connecting portion, an optical fiber (50) for output light, connected to an output end of the output light-outputting optical waveguide portion of the optical waveguide element; a

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reinforcing capillary (within the connector 52) for reinforcing a connection between the optical waveguide element and the output light-outputting optical fiber; a means for receiving the radiation mode light as monitoring light (Fig. 4 element 56). Isono teaches the mean for receiving the radiation mode light as being emitted from the converged waveguide to a single waveguide (16) incident onto reflective surface (10a) at an oblique angle and reflect the beam to the photodiode 56 to be converted into electrical signal. And the optical signal transmits through the cleaved surface (10a) onto the collimating lenses and to the fiber (50). Regarding claim 44, it is well known that a buffer layer of  $\text{SiO}_2$  is provided between the substrate of the modulator and the electrodes formed upon. This buffer layer allows the optoelectronic device to have a common ground plane.

However, Isono does not explicitly teach the radiation mode light being generated and passed through the dielectric substrate and Isono does not teach a reinforcing capillary formed from a transparent glass with a light reflective surface, feature (2).

Mekata teaches stabilizing the intensity modulator having a feedback loop with a monitoring signal (6); see Fig. 2-4. The Examiner respectfully points out that the radiation mode is a phenomenon occurs at the junction where the waveguide converges. As one having ordinary skill in the art would recognize that the radiation mode are often referred to as “leaky mode” or “cladding mode.” In Figure 2, Mekata teaches coupling the radiation mode into fiber (6) and sends the signal to the photodiode (12) to be detected and then converted to an electrical signal to a control module (8), which triggers the optimum bias voltage to control the Mach-Zehnder modulator.

However, Mekata does not teach a reinforcing capillary formed from a transparent glass with a light reflective surface.

Parriaux teaches an optical coupling device for coupling optical fiber to an optoelectronic component and connector devices. Here in Fig. 1, the hole of the reinforcing capillary for holding the optical fiber for the output light is formed along the longitudinal axis of the transparent glass (col. 4, line 50). Parriaux teaches that the coupler may be positioned adjacent to optoelectronic component (2) and the fiber continues to be supported by the extending groove (6) on substrate (5). The fiber is held in place by an adhesive agent exemplified by Fig. 3 (20).

Since Isono, Mekata and Parriaux are all from the same field of endeavor, the purpose disclosed by Mekata and Parriaux would have been recognized in the pertinent art of Isono.

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to recognize the purpose of a feedback loop is to shorten the transmission distance of optimizing the operational point in the intensity modulator. Isono's modulator condensed the detection distance by deflecting the converged signal on a reflective surface to the photodiode; however, Isono's modulator lacks the integral component, which allows the output portion to be condensed. However, Parriaux coupler was made for the same purpose, to integrally couple optoelectronic components with an optical fiber, which does not require accurate optical alignment. The modification can be made during manufacturing process since dry etching is prevalently used in production of semiconductor. Parriaux's coupler may be formed onto Isono's modulator by etching a through hole having a v-groove on the lower portion of the through hole to couple the output light to a fiber. To couple the radiation mode onto the substrate of Parriaux's couple, one of ordinary skill in the art may match the refractive index of

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the substrate with the refractive index of the radiation mode. The reflective surface of Isono's modulator may be maintained by cutting the surface at an oblique angle and deposit a metallic film onto the cleaved facet to deflect light to Isono's photodiode. Finally, Parriaux's coupler does not require perfect alignment and elements 4 and 5 does not have to touch to be aligned, thus the v-groove substrate (5) does not have to be cleaved at angle. The collimating lens as taught by Isono remains to condense the light beam for coupling a planar waveguide signal into an optical fiber core. These lenses may be separate lenses such as ball lens or integrally formed with the fiber such as a rod lens. **The motivation** for integrating Parriaux coupler into Isono's modulator is the need for coupling optoelectronic devices such as a Mach-Zehnder modulator, typically a semiconductor chip, to an optical transmissible means, optical fiber. By integrally etch Parriaux's coupler onto the modulator end portion, many of the output components may be eliminated, and the integral coupler allows optimum transmission of light energy without an extensive alignment procedure (col. 4, lines 5-45). Ultimately the intensity modulator having optimum controlling bias voltage feedback circuit is reduced to a smaller size.

### ***Response to Arguments***

Applicant's arguments with respect to claims 1, 5, 8-11, and 44 have been considered but are moot in view of the new ground(s) of rejection.

*Conclusion*

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Please see the Notice of Reference Cited for the references that were not used however they are pertinent to the application and in combination the references read upon the claimed limitations.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

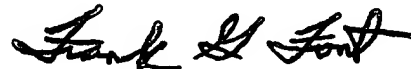
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Erin D. Chiem whose telephone number is (571) 272-3102. The examiner can normally be reached on Monday - Thursday 9AM - 5PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Frank G. Font can be reached on (571) 272-2415. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Erin D Chiem  
Examiner  
Art Unit 2883



Frank G. Font  
Supervisory Primary Examiner  
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